REMARKS

Examiner Farahani is thanked for his ongoing examination of our application. Reconsideration of the rejection of all claims is respectfully requested. We wish to comment on his response as follows:

Introduction

The present invention discloses a bipolar transistor structure whose base region is made up of two sub regions. A key feature of the invention is that the region closest to the collector is very uniformly doped, i.e. there is no concentration gradient and therefore no built-in field.

Reconsideration is requested of all rejections based on 35 U.S.C. 103:

In our response to examiner's first rejection, we drew his attention to two important and novel features of the present invention — (a) the absence of a concentration gradient in the base region and (b) the use of boron, rather than aluminum, to provide acceptor ions for doping this region.

Examiner has not been persuaded by these arguments, counter arguing as follows:

(a) ...a "uniform gradient distribution is also a gradient distribution of a gradient factor of one." This argument is not understood for several reasons:

(1) It is unclear what is meant by the term 'gradient factor'. If Examiner simply means the gradient itself, a value of one is meaningless without stating the units of the gradient. Thus, in a conventional bipolar transistor, the ionic concentration gradient in the base is typically about 5×10^{17} ions per cc. per micron. This reduces to 5×10^{5} ions per cubic micron per Angstrom. We would, however, be hard pressed to find units in which the gradient is reduced to one.

(2) Regardless of precisely what Examiner has in mind when he refers to a 'gradient factor of one', the key novel feature of the present invention is that the ionic gradient in the secondary base region is zero. This follows from lines 5 and 6 of claim 12 which claim "a secondary base region comprising P type silicon, throughout which boron ions are uniformly distributed.....". By definition, 'uniform distribution' means the absence of any concentration gradient.

(3) Without further input from Examiner we cannot know whether it is his position that a gradient of zero is qualitatively no different from a gradient of one. If it is, we respectfully ask whether he believes pure water to be no different from an aqueous solution (from a patent standpoint) since it represents a concentration of zero. If it is not, then we respectfully request that he cite a reference that explicitly teaches a bipolar transistor structure in which the base region is uniformly doped.

(b) Examiner has also rejected our argument to the effect that the use of boron

instead of aluminum is novel, counter arguing that "It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice." This statement is certainly true but it has also been held that if a combination of sub-structures leads to a non-obvious result then said combination is novel.

By substituting boron for aluminum in the base region of the present invention, a device is obtained whose I-V characteristics are as shown in FIG. 7. As Examiner surely knows, this is not a typical I-V curve for a bipolar transistor which makes it a non-obvious result. We also note here that, although substitution of boron for aluminum to provide acceptor ions is well known in the art, whenever this is done (namely during ion implantation) the resulting distribution of born is very non-uniform so that I-V curves of the type shown in our FIG. 7 are not obtained.

Allowance of all Claims is therefor requested. It is also requested that, should Examiner Farahani not find that the Claims are now Allowable, he should please call the undersigned Attorney at (845)-452-5863 to overcome any problems preventing Allowance.

Respectfully submitted

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